UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Alaska Fisheries Science Center
Resource Assessment and Conservation Engineering Division
7600 Sand Point Way Northeast
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CRUISE RESULTS

CHARTERED VESSEL CRUISE NO. 91-1
F/V OCEAN HOPE 1 AND F/V GREEN HOPE
1991 ALEUTIAN ISLANDS TRIENNIAL GROUNDFISH ASSESSMENT SURVEY
JULY 17-SEPTEMBER 27, 1991

The fourth triennial bottom trawl survey of the Aleutian Islands region was completed during the summer of 1991 by the Resource Assessment and Conservation Engineering (RACE) Division of the Alaska Fisheries Science Center (AFSC), Seattle, Washington. Previous surveys in this series were conducted in 1980, 1983, and 1986. This report summarizes the preliminary results of the 1991 survey.

ITINERARY

The survey was conducted in three 23-day legs aboard two chartered commercial trawlers, the Ocean Hope 1 and the Green Hope, from July 17 to September 27, 1991. The survey area covered a portion of the southern Bering Sea, from 165°W long. to 170°W long., and throughout the Aleutian Islands from 170°W long. to Stalemate Bank 170°30'E long. (Figure 1). Sampling proceeded from east to west at pre-selected stations at depths ranging from 9 to 285 fm (16 to 521 m).

OBJECTIVES

The triennial groundfish surveys are designed to describe and monitor the distribution, abundance, and biological condition of the important groundfish stocks in the Aleutian Islands area. The specific objectives of the 1991 survey were to:

1. define the distribution and relative abundance of the principal groundfish species inhabiting the Aleutian Islands area;

2. collect data to define selected biological parameters, i.e. age, sex, size, growth, length-weight relationships, feeding habits, and population age structure;

3. collect accurate mensuration data on the trawl nets used by each survey vessel; and

4. obtain ancillary data and collect specimens requested by other research groups, i.e. incidence of lamprey predation on pollock, pollock blood samples for DNA studies, whole fish specimens for the University of Washington fish collection, and whole specimens of skates for Bucknell University.

VESSELS AND GEAR

The Ocean Hope 1 is 108 ft (32.9 m) in overall length and powered by a single main engine with 850 continuous horsepower. Deck equipment included paired hydraulic winches with 600 fm (1,100 m) of 7/8" (2.2-cm) cable per drum, two hydraulic net reels (one mounted over the stern ramp and the other mounted forward on the working deck), and two winches (one moveable) mounted on the main boom for lifting. The Green Hope is 100 ft (30.7 m) in overall length and powered by a single main engine of 565 continuous horsepower. Deck equipment included paired hydraulic trawl winches with 800 fm (1,463 m) of 3/4" (1.91-cm) cable per drum, two hydraulic net reels (one mounted over the stern ramp and the other mounted forward on the working deck), and two stationary winches mounted on the main boom for lifting. Electronic equipment on both vessels consisted of Global Positioning System (GPS) and Loran C receivers with converters for geodetic positions, Loran C video plotters, two radars, single band and VHF radios, color video fish finders, and auto-pilots.

Both vessels used standard RACE Division Poly-Nor'eastern high opening bottom trawls rigged with roller gear. Gear specifications included: an 89'-1" (27.2-m) headrope with 21 12" (30-cm) diameter floats and a 79'-7" (24.3-m) 1/2" longlink alloy chain "fishing line" attached to an 81'-7" (24.9-m), 3/8" (.95-cm) diameter 6 x 19 galvanized wire footrope. The roller gear was 79'-6" (24.2 m) long and constructed of 3/4" (1.91-cm) diameter 6 x 19 galvanized wire rope, 14" (36-cm) rubber bobbins separated by a solid string of 4" (10-cm) rubber disks. In addition, 19'-6" (5.9-m) wire rope extensions with 4" (10-cm) and 8" (20-cm) rubber disks were used to span each lower flying wing section.

Trawls were constructed of 5" (12.7-cm) stretched-mesh polyethylene web with a 1-1/4" (3.2-cm) mesh nylon liner in the codend. Net rigging consisted of triple 180' (54.9-m), 5/8" (1.6-cm) diameter galvanized wire rope dandylines. The dandylines were rigged with 18" and 9" chain extensions to the headrope and side panel attachments, respectively. Steel V-doors with dimensions of 6'x 9' (1.83 x 2.74 m) and weighing approximately 1,700 lb (800 kg) each were used.

Standard trawl hauls were 30 minutes in duration, allowing between 3 and 12 minutes sinking time between setting the winch brakes and beginning the tow. Efforts were made to maintain each tow at a constant depth. In cases where depths increased during a tow, trawl warps increased accordingly. Catches were sorted to species, weighed, and enumerated according to standard AFSC and RACE Division protocol. A variety of biological data (age, length, sex, weight, and maturity of individual specimens) were taken. Special requests were also fulfilled for stomach, tissue, and whole fish samples.

Oceanographic data were collected throughout the cruise. Temperature profiles of the water column were gathered using a TSK[1] model 250B MicroBT profiler aboard the Ocean Hope 1 and bottom temperatures were recorded using a Bathy Systems XBT aboard the Green Hope. Sea surface temperature observations were taken aboard both vessels using bucket thermometers. The fishing dimensions of the trawls were measured aboard each vessel using Scanmar acoustic net mensuration systems.

RESULTS

Because of time lost to bad weather and gear repair, some stations were not sampled. Successful trawls were achieved at 340 of the 377 stations attempted. Additionally, two deep hauls (approximately 385 fm) were taken to collect uncommon skates for the Bucknell University fish collection.

A total of 108 fish species were identified in survey catches. In addition to the groundfish species, catches also contained representatives from numerous invertebrate orders. The types and numbers of biological data collected from fish are summarized in Table 1. The age structures collected, other than halibut otoliths, will be read by the age determination unit of the AFSC. Halibut otoliths will be processed by the International Pacific Halibut Commission.

Table 2 shows the dominant fish species ranked by catch per unit of effort, expressed as kilograms of catch per square kilometer trawled (kg/km^2), for the five major sampling strata (Figure 1). In the Aleutian Islands, Atka mackerel, Pacific ocean perch, northern rockfish (Sebastes polyspinis), walleye pollock, and Pacific cod dominated the catches in most strata. The largest fish concentrations encountered during the survey were in the western Aleutian Islands (west of 180°W) and were composed primarily of Atka mackerel, Pacific ocean perch, and northern rockfish. Catches in the eastern Aleutian Islands were

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[1] Reference to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

STAFFING FOR 1991
ALEUTIAN ISLANDS TRIENNIAL SURVEY

OCEAN HOPE 1

LEG 1

DATES:	July 17 - Aug. 7	
PORTS:	Dutch Harbor, AK. - Adak, AK	
PERSONNEL:	Peter Munro, FPC	AFSC
	David Roetcisoender	AFSC
	Tom Rutecki	ABL
	Teresa Turk	AFSC
	Laura Garmann	IPHC

LEG 2

DATES:	Aug. 8 - Aug. 27	
PORTS:	Dutch Harbor, AK. - Adak, AK.	
PERSONNEL:	Robin Harrison, FPC	AFSC
	William Flerx	AFSC
	Paul Raymore	AFSC
	Elizabeth Chilton	IPHC
	William Raschi	BU

LEG 3

DATES:	Aug. 28 - Sept. 27	
PORTS:	Dutch Harbor, AK. - Dutch Harbor, AK	
PERSONNEL:	Eric Brown, FPC	AFSC
	Ronald Payne	AFSC
	Ellen Varosi	AFSC
	Shelly Jay	AFSC
	Laura Garmann	IPHC

GREEN HOPE

LEG 1

DATES:	July 17 - Aug. 7	
PORTS:	Dutch Harbor, AK. - Dutch Harbor, AK	
PERSONNEL:	Ronald Payne, FPC	AFSC
	James Stark	AFSC
	Robin Harrison	AFSC
	Kirsten Rohrbach	AFSC
	Delsa Anderl	AFSC

LEG 2

DATES:	Aug. 8 - Aug. 27	
PORTS:	Dutch Harbor, AK. - Dutch Harbor, AK.	
PERSONNEL:	Peter Munro, FPC	AFSC
	Ken Weinberg	AFSC
	Pierre Dawson	AFSC
	Gary Mundell	AFSC
	Mei-Sun Yang	AFSC

LEG 3

DATES:	Aug. 28 - Sept. 27	
PORTS:	Dutch Harbor, AK. - Dutch Harbor, AK	
PERSONNEL:	William Flerx, FPC	AFSC
	James Stark	AFSC
	David Baker	AFSC
	Damian Preziosi*	BU
	Teresa Turk	UW

* Left vessel September 5th

FPC = Field Party Chief
AFSC = Alaska Fisheries Science Center
IPHC = International Pacific Halibut Commission
BU = Bucknell University
UW = University of Washington
ABL = Auke Bay Laboratory, Alaska Fisheries Science Center

Table 1.--Biological data collected during the 1991 Aleutian Islands triennial survey.

Species	Number of observations or specimens collected			
	Length Frequencies	Age Structures[1]	Specimen Weights	Stomach
Walleye pollock	15,602	907	532	528
Pacific cod	8,543	919	669	648
Sablefish	166	--	--	2
Arrowtooth flounder	6,843	607	409	332
Pacific halibut	2,118	758	--	202
Rock sole	11,855	490	325	115
Flathead sole	3,259	--	--	--
Rex sole	623	--	--	--
Dover sole	8	--	--	--
Greenland Turbot	506	195	119	44
Kamchatka flounder	1,228	--	--	--
Yellowfin sole	124	--	--	--
Atka mackerel	7,155	485	272	238
Shortspine thornyhead	1,286	437	289	67
Pacific ocean perch	14,262	1,028	844	246
Northern rockfish	4,853	466	189	138
Rougheye rockfish	1,060	480	381	63
Shortraker rockfish	782	346	232	24
Dusky rockfish	50	--	--	--
Harlequin rockfish	39	--	--	--
Yellow Irish Lord	28	--	--	--
Giant grenadiers	222	--	--	--
Kelp greenling	15	--	--	--
English sole	20	--	--	--
Butter sole	84	--	--	--
Starry flounder	18	--	--	--
Pacific herring	182	--	--	--

[1]Scales and otoliths were collected from Pacific cod. Otoliths were collected from all other species.